**Lab 4 Proximity Sensor – ECE 5780**

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**Objective**

The purpose of this lab is to implement a program using FreeRTOS to produce 8 different notes from 220 Hz to 440 Hz when an LED is activated by a button push on our STM32 Nucleo Board. These will be produced as sine waves that are then put through an audio amplifier circuit and an 8-ohm speaker to produce the sound of the sine wave.

**Procedure**

**Results**

For our lab to produce the desired results we had to modify our existing Lab 2 code to be able to produce 8 sine wave frequencies (notes) from 220 Hz to 440 Hz.

A circuit board with wires connected to it

Description automatically generated

**Figure 1. Audio Amplifier Circuit connected to our STM32 Nucleo Board**

**Figure 2. Code Snippet of the ARR values that produce the different note frequencies**

**Conclusion**

In conclusion, we learned a lot from the issues of this lab. Overall, this was a challenging lab for us but in the end, we were able to accomplish all the lab requirements successfully.

**Appendix**

***Main.c code***

***Init.c code***